IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	Varsamis et al.		
Serial No.:	10/710,513	Group No.:	3663
Date Filed:	07/16/2004		
For: Seismic Data Acquisition System and Method for Downhole Use		Examiner:	Hughes, Scott A.

RESPONSE TO OFFICE ACTION

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In response to the office action made final November 7, 2005, please accept this amendment filed with a petition for an extension of time. Please amend this application as follows:

Amendments to the Specification begin on page 2 of this paper.

Amendments to the Claims are reflected in the listing of claims beginning on page 4 of this paper.

Remarks begin on page 18 of this paper.

AMENDMENTS TO THE SPECIFICATION

Please amend the original specification filed on July 16, 2004 by replacing paragraph [0055] with the following paragraph:

Replace:

The upper and the lower connectors 42, 44 are coupled to nodes or interfaces 72, 74, respectively. Interface 72 is in turn coupled to communications converter 112 by a capacitor 116, and interface 74 is likewise coupled to a communications converter 114 by a capacitor 118. Capacitors 116, 118 block direct current but allow signals to pass. The communications converters 112, 114 include circuitry typically used to allow a processor to communicate serially, such as line drivers, a buffer, and a universal receiver/transmitter which converts data from a parallel to serial arrangement and vice versa. The communications converters 112, 114 communicate with a 120. The processor 120 includes memory, e.g., RAM 28' for local storage of data. The processor 120 in turn controls the clamping mechanism via a motor controller or solenoid driver 122, communicates with the onboard sensors via a sensor converter 124, and communicates with the telemetry and control module 21' and/or the main controller 20'.

with:

The upper and the lower connectors 42, 44 are coupled to nodes or interfaces 72, 74, respectively. Interface 72 is in turn coupled to communications converter 112 by a capacitor 116, and interface 74 is likewise coupled to a communications converter 114 by a capacitor 118. Capacitors 116, 118 block direct current but allow signals to pass. The communications converters 112, 114 include circuitry typically used to allow a processor to communicate serially, such as line drivers, a buffer, and a universal receiver/transmitter which converts data from a parallel to serial arrangement and vice versa. The communications converters 112, 114

communicate with a processor 120. The processor 120 includes memory, e.g., RAM 28' for local storage of data. The processor 120 in turn controls the clamping mechanism via a motor controller or solenoid driver 122, communicates with the onboard sensors via a sensor converter 124, and communicates with the telemetry and control module 21' and/or the main controller 20'.

<u>AMENDMENTS TO THE CLAIMS</u>
(with complete listing)

1-19. (Cancelled)

20. (Currently amended) A sensor array (18′) comprising,

~~a telemetry and control module (21′), and~~

a plurality of sensor pods (12′) ~~coupled to said telemetry and control module,~~

each ~~of said plurality of sensor pods (12′)~~ characterized by having a sensor (126) therein <u>operatively</u> coupled to a memory (28′), <u>a processor operatively coupled to said memory,</u> ~~having~~ a first <u>telemetric communications</u> interface (72) <u>operatively</u> coupled to said memory, ~~having~~ <u>and</u> a second <u>telemetric communications</u> interface (74) <u>operatively</u> coupled to said memory~~, and being designed and arranged to transfer first data from said memory to said first interface and second data from said second interface to said memory,~~

~~said telemetry and control module (21′) coupled to said first interface of a first of said plurality of sensor pods (12′) and~~

said second <u>telemetric communications</u> interface of ~~said~~ <u>a</u> first of said plurality of sensor pods (12′) coupled to said first <u>telemetric communications</u> interface of a second of said plurality of sensor pods (12′)[.]<u>, and</u>

<u>a telemetry and control module (21′) communicatively coupled to said first telemetric communications interface of said first of said plurality of sensor pods (12′).</u>

21. (Currently amended) The sensor array of claim 20 wherein

each of said plurality of sensor pods (12′) is ~~designed and~~ arranged to simultaneously transfer first data from said memory to said first <u>telemetric communications</u> interface and second data from said second <u>telemetric communications</u> interface to said memory.

22. (Currently amended) The sensor array of claim 20 wherein,

first pod data is produced by said sensor of said first of said plurality and transferred to said memory of said first of said plurality,

second pod data is produced by said sensor of said second of said plurality and transferred to said memory of said second of said plurality,

said first pod data is transferred from said memory of said first of said plurality through said first telemetric communications interface of said first of said plurality to said telemetry and control module, and

said second pod data is transferred from said memory of said second of said plurality through said first telemetric communications interface of said second of said plurality and through said second telemetric communications interface of said first of said plurality to said memory of said first of said plurality.

23. (Currently amended) The sensor array of claim 22 wherein,

said first pod data is transferred from said memory of said first of said plurality through said first telemetric communications interface of said first of said plurality to said telemetry and control module, and simultaneously

said second pod data is transferred from said memory of said second of said plurality through said first telemetric communications interface of said second of said plurality and through said second telemetric communications interface of said first of said plurality to said memory of said first of said plurality.

24. (Currently amended) The sensor array of claim 22 wherein,

said second pod data is transferred from said memory of said first of said plurality through said first telemetric communications interface of said first of said plurality to said telemetry and control module.

25. (Currently amended) The sensor array of claim 20 wherein,

said plurality includes said first of said plurality, a last of said plurality and at least one inner of said plurality,

each of said at least one inner of said plurality has said first telemetric communications interface coupled to said second telemetric communications interface of a first adjacent of said plurality and said second telemetric communications interface coupled to a second adjacent of said plurality,

said first telemetric communications interface of said last of said plurality is coupled to said second telemetric communications interface of one of said at least one inner of said plurality, and

said first telemetric communications interface of said first of said plurality is coupled to said telemetry and control module and said second telemetric communications interface of said first of said plurality is coupled to said first telemetric communications interface of one of said at least one inner of said plurality.

26. (Original) The sensor array of claim 25 wherein,

last pod data is produced by said seismic sensor of said last of said plurality and transferred to said memory of said last of said plurality,

said last pod data is transferred from said memory of said last of said plurality to said telemetry and control module via each of said at least one inner of said plurality, being temporarily stored in said memory of each of said at least one inner of said plurality, and via said first of said plurality, being temporarily stored in said memory of said first of said plurality.

27. (Currently amended) The sensor array of claim 20 wherein each of said plurality is further characterized by,

a communications bypass (130) coupled between said first telemetric communications interface and said second telemetric communications interface,

said communications bypass having a switch element (132) having a first state which enables said bypass and a second state which disables said bypass.

28. (Currently amended) The sensor array of claim 27 wherein each of said plurality is further characterized by,

said switch element (132) being controlled by said sensor pod (12′) in response to a signal received at said first telemetric communications interface (72).

29. (Original) The sensor array of claim 28 wherein,

said signal originates from said telemetry and control module (21′).

30. (Original) The sensor array of claim 28 further comprising,

a surface controller (20′) coupled to said telemetry and control module (21′), wherein said signal originates from said surface controller.

31. (Currently amended) The sensor array of claim 28 wherein,

said signal originates from said second telemetric communications interface (74) of an adjacent one of said plurality of sensor pods.

32. (Currently amended) The sensor array of claim 29 wherein,

said switch elements (132) of each of said plurality are in said first state, and

each of said plurality of said pods nearly simultaneously receives said signal at said first telemetric communications interface from said telemetry and control module (21′).

33. (Currently amended) The sensor array of claim 29 further comprising,

a surface controller (20′) coupled to said telemetry and control module (21′), wherein said switch elements (132) of each of said plurality are in said first state, and

each of said plurality of said pods nearly simultaneously receives said signal at said first telemetric communications interface from said surface controller (20′).

34. (Original) The sensor array of claim 32 wherein,

said signal causes said sensors (126) of each of said plurality to measure data and transfer said data to corresponding said memories (28′) of each of said plurality.

35. (Original) The sensor array of claim 20 wherein,

communication between said plurality of sensor pods uses a communications protocol, and

communication between said telemetry and control module and said first of said plurality uses a communications protocol.

36. (Original) The sensor array of claim 35 wherein

said communications protocol is a serial communications protocol.

37. (Currently amended) The sensor array of claim 20 further comprising,

a repeater (46) coupled between any two of said plurality of pods (12′), said repeater ~~designed and~~ arranged to increase the communications range between said two of said plurality.

38. (Currently amended) The sensor array of claim 20 wherein each of said plurality further comprises,

a clamping mechanism (26′, 122) ~~designed and~~ arranged to releasably clamp said sensor pod to a borehole wall.

39. (Currently amended) The sensor array of claim 38 wherein each of said plurality is further characterized by,

said clamping mechanism (26′, 122) being controlled by said sensor pod in response to a signal received at said first telemetric communications interface (72).

40. (Original) The sensor array of claim 39 wherein,

said signal originates from said telemetry and control module (21′).

41. (Original) The sensor array of claim 39 further comprising,

a surface controller (20′) coupled to said telemetry and control module (21′), wherein said signal originates from said surface controller.

42. (Currently amended) The sensor array of claim 39 wherein,

said signal originates from said second telemetric communications interface (74) of an adjacent one of said plurality of sensor pods (12′).

43. (Currently amended) The sensor array of claim 20 wherein each of said plurality further comprises,

a processor (120) coupled to said memory (28′), said first telemetric communications interface (72) and said second telemetric communications interface (74), said processor ~~designed and~~ arranged to interpret signals received at said first telemetric communications interface and control said sensor pod.

44. (Original) The sensor array of claim 20 wherein,

said sensor is a seismic sensor.

45. (Currently amended) The sensor array of claim 20 further comprising,

a plurality of cables (24′), wherein

each of said plurality of sensor pods (12′) has upper and lower ends and characterized by being ~~designed and~~ arranged to be repeatably coupled and uncoupled to a first and second of said plurality of cables at both said upper and lower ends, and

said plurality of sensor pods are removably coupled together upper end to lower end by said plurality of cables to form a string, with a first end of said string of sensor pods removably coupled to said telemetry and control module with one of said plurality of cables.

46. (Currently amended) The sensor array of claim 45 wherein each of said plurality of sensor pods is characterized by,

having a processor (120) ~~designed and~~ arranged to communicate with said telemetry and control module and with other sensor pods and ~~designed~~ arranged to store an identification.

47. (Currently amended) The sensor array of claim 46 wherein,

said telemetry and control module can query each of said plurality of sensor pods, and

each of said plurality of sensor pods is ~~designed and~~ arranged to answer a query.

48. (Original) The sensor array of claim 47 wherein,

said telemetry and control module harmonizes with said plurality of sensor pods to establish a unique identification for each of said plurality of sensor pods, and,

said telemetry and control module (21′) registers the position in said string of each of said sensor pods relative to the plurality of sensor pods.

49. (Original) The sensor array of claim 47 wherein,

using a particular identification, said telemetry and control module queries a specific one of said plurality of sensor pods, and

said specific one of said plurality of sensor pods answers said telemetry and control module.

50. (Original) The sensor array of claim 49 wherein,

said telemetry and control module queries about a status of a sensor (126).

51. (Original) The sensor array of claim 49 wherein,

said telemetry and control module queries about a status of a memory (28′).

52. (Original) The sensor array of claim 49 wherein,

said telemetry and control module queries about a voltage level.

53. (Original) The sensor array of claim 49 wherein,

said telemetry and control module queries about a status of a clamping mechanism (26′, 122).

54. (Original) The sensor array of claim 47 wherein,

using a particular identification, said telemetry and control module commands a function of a specific one of said plurality of sensor pods, and

said specific one of said plurality of sensor pods performs said function.

55. (Original) The sensor array of claim 54 wherein,

said telemetry and control module commands to manipulate a clamping mechanism (26′, 122).

56. (Original) The sensor array of claim 54 wherein,

said telemetry and control module commands to manipulate a switch element (132).

57. (Original) The sensor array of claim 54 wherein,

said telemetry and control module commands to control a sensor (126).

58. (Original) The sensor array of claim 47 wherein,

said telemetry and control module simultaneously commands each of said plurality of sensor pods to record data.

59. (Original) The sensor array of claim 47 wherein,

said telemetry and control module nearly simultaneously commands each of said plurality of sensor pods to transmit data.

60. (Original) The sensor array of claim 45 further comprising,

a main controller (20′) coupled to said telemetry and control module (21′).

61. (Currently amended) The sensor array of claim 60 wherein each of said plurality of sensor pods is characterized by,

having a processor (120) ~~designed and~~ arranged to communicate with said main controller and with other sensor pods and to store an identification.

62. (Currently amended) The sensor array of claim 61 wherein,

said main controller is ~~designed and~~ arranged to query each of said plurality of sensor pods, and

each of said plurality of sensor pods is ~~designed and~~ arranged to answer a query.

63. (Currently amended) The sensor array of claim 62 wherein,

said main controller is ~~designed and~~ arranged to harmonize with said plurality of sensor pods to establish a unique identification for each of said plurality of sensor pods, and

said main controller (20′) is ~~designed and~~ arranged to register the position in said string of each of said sensor pods relative to the plurality of sensor pods.

64. (Currently amended) The sensor array of claim 62 wherein,

using a particular identification, said main controller is ~~designed and~~ arranged to query a specific one of said plurality of sensor pods, and

said specific one of said plurality of sensor pods is ~~designed and~~ arranged to answer said main controller.

65. (Currently amended) The sensor array of claim 64 wherein,

said main controller is ~~designed and~~ arranged to query about a status of a sensor (126).

66. (Currently amended) The sensor array of claim 64 wherein,

said main controller is ~~designed and~~ arranged to query about a status of a memory (28′).

67. (Currently amended) The sensor array of claim 64 wherein,

said main controller is ~~designed and~~ arranged to query about a voltage level.

68. (Currently amended) The sensor array of claim 64 wherein,

said main controller is ~~designed and~~ arranged to query about a status of a clamping mechanism (26′, 122).

69. (Currently amended) The sensor array of claim 62 wherein,

using a particular identification, said main controller is ~~designed and~~ arranged to command a function of a specific one of said plurality of sensor pods, and

said specific one of said plurality of sensor pods is ~~designed and~~ arranged to perform said function upon said command.

70. (Currently amended) The sensor array of claim 69 wherein,

said main controller is ~~designed and~~ arranged to command a specific one of said plurality of sensor pods to manipulate a clamping mechanism (26′, 122).

71. (Currently amended) The sensor array of claim 69 wherein,

said main controller is ~~designed and~~ arranged to command a specific one of said plurality of sensor pods to manipulate a switch element (132).

72. (Currently amended) The sensor array of claim 69 wherein,

said main controller is ~~designed and~~ arranged to command a specific one of said plurality of sensor pods to control a sensor (126).

73. (Currently amended) The sensor array of claim 62 wherein,

said main controller is ~~designed and~~ arranged to simultaneously command each of said plurality of sensor pods to record data.

74. (Original) The sensor array of claim 62 wherein,

said main controller nearly simultaneously commands each of said plurality of sensor pods to transmit data.

75-95. (Cancelled)

96. (New) A sensor array for conducting a downhole survey comprising,

a string (18′) of intelligent sensor pods (12′) each sensor pod including a sensor (126) and a memory (28′),

a telemetry and control module (21′) operatively connected to a first end of said string,

means for collecting data with said sensors,

means for storing said data in said memory, and

means for transmitting said data from said memory to said telemetry and control module in a bucket brigade transfer, where a bucket brigade transfer is defined by each sensor pod transmitting data stored in the memory of said sensor pod to a memory of an adjacent device in said string of intelligent sensor pods in a first direction and each sensor pod receiving data, if any, from a memory of an adjacent device in said string of intelligent sensor pods in a second direction opposite said first direction, if any, and storing said received data in said memory of said sensor pod.

97. (New) The apparatus of claim 96 wherein,

said survey is a seismic survey, and

said data are seismic data.

98. (New) The apparatus of claim 96 wherein,

said transmitting and receiving of data occurs simultaneously.

99. (New) The apparatus of claim 96 wherein,

said transmitting and receiving of data occurs sequentially.

100. (New) The apparatus of claim 96 further comprising,

means for arming each sensor pod within said string to receive a simultaneous trigger signal by enabling a direct communications path (132, 130) along a common conductor (24′, 72) to each sensor pod within said string.

101. (New) The apparatus of claim 96 further comprising,

means for powering said string (18′) of intelligent sensor pods (12′) via said common conductor (24′, 72).

102. (New) The apparatus of claim 96 further comprising,

means for simultaneously triggering each sensor pod within said string of intelligent sensor pods to begin recording data.

103. (New) The apparatus of claim 102 wherein,

said triggering is caused by a signal transmitted by said telemetry and control module (21′) along said common conductor.

104. (New) The apparatus of claim 102 further comprising,

a surface controller (20′) coupled to said telemetry and control module, wherein

said triggering is caused by a signal originating from said surface controller.

105. (New) The apparatus of claim 100 further comprising,

means for simultaneously triggering each sensor pod to begin said bucket brigade transfer, and

means for disabling said direct communications path (130, 132) after said triggering, forcing communication along said string to flow through said memory (28′) of said sensor pods.

106. (New) The apparatus of claim 105 wherein,

said triggering is caused by a signal transmitted by said telemetry and control module (21′) along said common conductor.

107. (New) The apparatus of claim 105 wherein,

a surface controller (20′) is coupled to said telemetry and control module, and

said triggering is caused by a signal originating from said surface controller.

108. (New) The apparatus of claim 96 further comprising,

means for disconnecting said telemetry and control module (21′) from said string of intelligent sensor pods, and

means for disassembling said string of intelligent sensor pods.

109. (New) The apparatus of claim 96 further comprising,

means for automatically determining the composition and characteristics of said string (18′) by querying said intelligent sensor pods (12′).

110. (New) The apparatus of claim 96 further comprising,

means for selectively clamping said sensor pods (12′) to a wall of said borehole (14),

means for selectively unclamping said sensor pods from said wall, and

means for controlling said selective clamping and selective unclamping with said telemetry and control module (20′).

111. (New) The apparatus of claim 96 further comprising,

means for selectively clamping said sensor pods (12′) to a wall of said borehole (14),

means for selectively unclamping said sensor pods from said wall, and

means for controlling said selective clamping and selective unclamping with a surface controller (21′) coupled to said telemetry and control module.

112. (New) The apparatus of claim 96 further comprising,

a repeater (46) operatively coupled between two adjacent sensor pods in said string of intelligent sensor pods, whereby said repeater extends a communications range between said two adjacent sensor pods.

113. (New) A sensor array comprising:

a first sensor pod having a first memory and a first sensor disposed therein, said first sensor in communication with said first memory,

a second sensor pod having a second memory and a second sensor disposed therein, said second sensor pod connected to said first sensor pod by a first cable segment, said second memory in communication with said first memory, said second sensor in communication with said second memory, and

a third sensor pod having a third memory and a third sensor disposed therein, said third sensor pod connected to said second sensor pod by a second cable segment, said third memory in communication with said second memory, said third sensor in communication with said third memory, whereby

data contents of said second memory is transferred to said first memory and data contents of said third memory is transferred to said second memory in a bucket brigade fashion.

REMARKS

Paragraph [0055] of the specification is amended to correct a typographical omission of the word "processor." No new matter is introduced.

Claims 75-94 are cancelled. New claims 96-113 are added that cover the subject matter the inventors claim as their invention. Claims 96-113 cover the subject matter of claims 20-74 and form a generally alternative expression of a single inventive concept. Claims 96-113 are fully supported by the specification.

The examiner objected to claims 22-24 as containing informalities, reciting limitations of “first pod data” and “second pod data,” while claim 20, upon which claims 22-24 depend, recites simply “first data” and “second data.” The limitations of “first pod data” and “second pod data” are not intended to refer to the more generalized “first data” and “second data” terms of claim 20. Nevertheless, to avoid any ambiguity and to make the claims easier to read and comprehend, claim 20 is amended to remove the terms “first data” and “second data.”

The examiner rejected claims 20-74 under section 112 second paragraph because the limitation “designed” is unclear. Claims 20, 21, 37, 38, 43, 45-47, and 61-73 are amended to remove the limitation “designed.”

The examiner rejected claims 20-21, 25, 35-36, 38-51, 53-55, and 57-59 as being anticipated by Zimmer (U.S. 5,175, 392). The “second interface coupled to said memory” limitation of claim 20 has been broadly construed by the examiner to read on the ADC and CPU in Zimmer’s device. Claim 20 is thus amended to more particularly claim the subject matter that the inventors regard as their invention. Specifically, claim 20 is amended to include the limitation that the memory (28′) in each sensor pod (12′) is operatively coupled to a processor

(120), a sensor (126), a first telemetric communications interface (72), and a second telemetric communications interface (74).

"Telemetric," as the term is commonly defined and as used herein, refers to an apparatus for measuring a quantity, transmitting the result to a distant station, and indicating or recording the quantity measured at the distant station. Merriam-Webster Inc., Webster's Third New International Dictionary of the English Language Unabridged (2002). This amendment is fully supported by the specification. See, for example, communications converters 112, 114 of Figure 5, and col. 6 paragraph [0055] ("The communications converters 112, 114 include circuitry typically used to allow a processor to communicate serially, such as line drivers, a buffer, and a universal receiver/transmitter which converts data from a parallel to serial arrangement and vice versa."). The first and second telemetric communications interfaces allow the sensor array to communicate sensor data to distant stations in a bucket brigade manner.

Conversely, the ADC and CPU in Zimmer clearly are not telemetric communications interfaces as they are not adapted for transmitting data to a distant station. Rather, the ADC, CPU and memory of Zimmer are not capable in and of themselves of transmitting data at greater than very short distances. For example, Zimmer states, "A typical CPU can be provided by an 80188 processor." Zimmer col. 4 ll. 51-52. It is well known in the art that a microprocessor of this or a similar type is not adapted for directly transmitting data to a distant station. Zimmer does disclose one telemetric communications interface (30) operatively coupled to the memory, but Zimmer does not disclose a first and second telemetric communications interface disposed in each sensor pod in the string of sensor pods.

Claims 21-25, 27, 28, 31-33, 39, 42, and 43 are amended to use consistent "telemetric communications interface" terminology as in claim 20. In view of these amendments, claims 20-25, 27, 28, 31-33, 39, 42, and 43 are novel over Zimmer.

Claims 22-24, 26-34, 37, 52, 56, and 60-74 are rejected as unpatentable over Zimmer in view of Laborde (U.S. 6,816,082), Baliguet (U.S. 2003/0176974), Endo (U.S. 6,630,890), and/or Tubel (U.S. 5,730,219). However, as independent claim 20, upon which these claims depend, is amended to differentiate over Zimmer, these claims are now believed to be patentably distinct.

Furthermore, regarding the Laborde reference, the examiner asserts that Laborde discloses that data from sensors in a borehole is transferred from node to node in bucket brigade style, so that it would have been obvious to modify Zimmer to bucket brigade transfer of data as taught by Laborde and to store the data in the memory of each device as it is passed up to the telemetry and control module in order to limit the amount of data being sent over the bandwidth of the transmission cable at the time and also to store the data in case of a communication failure along the line as the data is being transferred. Office Action of February 3, 2006 at 11.

In response, applicant submits that the Laborde device is nearly identical to a typical prior art device as illustrated in Figure 3 of applicants' application and does not disclose a bucket brigade mode of data transfer. Referring to Figure 4 of Laborde, each node 202, 206, 210 communicates directly from its modem <u>directly</u> to the surface mode 200 over cable segments 244, 242, 240 and isolation switches 306, 304 and 302. Like the analog switch 54 of Figure 3 of the present application, switches 306, 304, 302 of Laborde serve simply to connect or disconnect a given mode directly to the surface node 200. See, for example, paragraph [0017] of present application and col. 4 ll. 40-51 of Laborde. In Laborde, data is not transferred from node to node by active operation of each node, but it is merely transferred from a given node directly to the

surface node, incidentally passing along one or more conductors physically disposed through other passive nodes. Each modem 314, 312, 310 communicates directly with modem 370 of surface node 200. "Data may be acquired by the sensing devices and transferred to the downhole nodes for transmission up the communications link 21." Laborde col 2 ll. 42-44. "The length of the link may be very long, running between thousands of feet to tens of thousands of feet." Laborde col. 6 ll. 52-54. Nowhere does Laborde disclose or suggest that modem 314 communicates with modem 312, which in turn communicates with modem 310, which finally communicates with modem 320 at surface node 200 to transfer data from node 210 to surface node 200 in a bucket brigade fashion.

Where the references taken together fail to disclose all of the limitations in the claim, a prima facie case of obviousness is not shown. Laborde does not disclose a bucket-brigade style of data transfer that would suggest modification of the Zimmer device. As Laborde combined with Zimmer fails to disclose a bucket brigade communication method, the section 103 rejection is improper, notwithstanding the present amendment to claim 20.

Regarding new independent claims 96 and 113, each includes a limitation that data is transferred from one sensor pod to an adjacent device in the string in a bucket brigade transfer fashion. Clearly, Zimmer does not disclose this limitation. The data in each sensor pod is transmitted directly to the telemetry unit along a common bus in a continuous cable passing through the sensor pods, and not by passing through the memory of each sensor pod positioned in the string enroute to the telemetry unit. See, for example: Zimmer col. 7 ll. 26-28 ("This short travel distance eases the telemetry requirements from the most remote of the recording stations 15 to the [main] unit 10."); col. 2 ll. 51-55 ("Thereafter, a telemetry unit [30] transmits from the localized memory [31] to a main memory [25] and the main memory [25], in

conjunction with a main telemetry system [24], transmits data up the logging cable for recovery at the surface."; col. 7 l. 65 - col. 8 l. 5 ("The first set of data from the first impulse is recorded over a period of time (e.g., eight seconds) while the data is being created and is stored in the memories 31 of the M stations 15. Depending on the data transfer rate from the telemetry unit 30 up to the main unit 10, the M stations can be cleared of data in the several memories 31 so that all that data is written in the memory 25 to leave the memory units 31 cleared of data."); and col. 11 ll. 13-21 ("wherein each of said M identical recording stations [15] includes a [sic] associated memory [31] and further including the steps of converting seismic signals at said M stations into a recordable form for the associated memory, storing signals in the associated memory [31] for a finite interval, and in specific sequence, making the telemetry transfer from the M recording station memories into the main memory [25]"). Furthermore, from the above discussion of Laborde, it is clear that Laborde also does not disclose the limitation that data is transferred from one sensor pod to an adjacent device in a bucket brigade transfer fashion.

In contrast, claims 96 and 113 require a bucket brigade transfer, where a bucket brigade transfer is clearly defined in the specification as each sensor pod transmitting data stored in the memory of said sensor pod to a memory of an adjacent device in a first direction (usually a sensor pod, but could be a repeater or, for the uppermost sensor pod, the telemetry unit), and receiving data stored in a memory of an adjacent device, in an opposite direction, if any, and storing it in the memory of the sensor pod, so that data is temporarily stored in the memory of each device up the string of sensor pods as it is passed to the telemetry and control module. Specification at paragraphs [0049] - [0050].

In summary, claims 20-74 and 96-113 remain in the application and are believed to be in condition for allowance. Allowance and passage to issue is respectfully requested.

Respectfully submitted,

Brett T. Cooke

Brett T. Cooke
Reg. No. 55,836

Andrews & Kurth L.L.P.
600 Travis, Suite 4200
Houston, Texas 77002
713/220-3813 (office)
713/238-4285 (facsimile)
Customer No. 23,444

Date: June 2, 2006